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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/601,752	06/23/2003	Taketoshi Toyama	Fukuda Case 40	9520

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EXAMINER	
ZIMMERMAN, JOHN J	

ART UNIT	PAPER NUMBER
1775	

DATE MAILED: 06/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/601,752	TOYAMA ET AL.	
	Examiner	Art Unit	
	John J. Zimmerman	1775	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,9 and 12* is/are rejected.

7)☒ Claim(s) *3-8, 10-11* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

FIRST OFFICE ACTION

Preliminary Amendment

1. The Preliminary Amendment filed with this application has been entered. Claims 1-12 are pending in this application.

Priority

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 9 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

5. Claim 9 is indefinite because it depends on claim 5, but recites that the copper content of the fin material is 0.05-0.3% even though claim 5 recites that the upper limit of the copper content of the fin material is 0.2% or less. Applicant should correct this discrepancy in the copper content of the fin material.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1-2 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kaifu (U.S. Patent 4,908,184) in view of applicant's disclosure of the prior art.

8. Kaifu discloses that high strength, corrosion resistant aluminum alloy core material for automobile heat exchangers can be made by forming the core material to have a fibrous structure before brazing (e.g. see column 3, lines 20-36). The core is clad on both sides with aluminum-silicon brazing material (e.g. column 3, line 62 - column 4, line 18). Kaifu may not disclose the crystal grain diameter of the structure after brazing, but Kaifu clearly indicates that the grain formation is directly related to the suppression of penetration of the filler metal and susceptibility to intergranular corrosion (e.g. see column 3, lines 23-29). In view of Kaifu, it would have been obvious to one of ordinary skill in the art at the time the invention was made to optimize the

grain formation of Kaifu to suppress penetration of the filler and susceptibility to intergranular corrosion because these properties are desirable in the manufacture of heat exchanger materials. Kaifu may differ from the claims in that Kaifu may not require that the material have a thickness of 80 μm or less. Applicant, however, clearly discloses that there is a motivation in the prior art to reduce the weight of automotive heat exchangers and therefore the thickness of the materials (e.g. see Background of the Invention, page 3, line 3 - page 4, line 10). In view of applicant's disclosure of the prior art, it would have been obvious to one of ordinary skill in the art at the time the invention was made to reduce the thickness of the material of Kaifu to 80 μm or less because there is a clear disclosed prior art motivation to reduce the thickness of the materials in order to reduce the weight of the products.

9. Claims 1-2 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawahara (U.S. Patent 6,,620,265) in view of Kaifu (U.S. Patent 4,908,184) and further in view of applicant's disclosure of the prior art.

10. Kawahara discloses that fin material for automobile heat exchangers can contain up to 0.3 mass % Cu, up to 0.15 mass % Zr, up to 0.15 mass% Cr (e.g. see column 1 lines 27-44) and can be made with a fiber structure (e.g. see Table 6; column 17, lines 21-25). Kawahara differs from the claims in that while Kawahara suggest that the fin material is for brazing (e.g. see column 31, lines 43-52), Kawahara may not disclose cladding the braze materials on the fin material, optimizing the grain diameter and may not require that the thickness must be 80 μm or less. Regarding the grain diameter, Kaifu discloses that high strength, corrosion resistant aluminum

alloy core material for automobile heat exchangers can be made by forming the core material to have a fibrous structure before brazing (e.g. see column 3, lines 20-36) and furthermore Kaifu clearly indicates that the grain formation is directly related to the suppression of penetration of the filler metal and susceptibility to intergranular corrosion (e.g. see column 3, lines 23-29). In view of Kaifu, it would have been obvious to one of ordinary skill in the art at the time the invention was made to optimize the grain formation of Kawahara to suppress penetration of the filler and susceptibility to intergranular corrosion because these properties are desirable in the manufacture of heat exchanger materials. Regarding the cladding of the braze material, Kaifu discloses that it is convention in the art that the core can be clad on both sides with aluminum-silicon brazing material (e.g. column 3, line 62 - column 4, line 18). In view of Kawahara's disclosure to use his fin material for brazing, it would have been obvious to one of ordinary skill in the art at the time the invention was made to clad the fin material with aluminum-silicon braze as shown by Kaifu. In addition, applicant also discloses that it is conventional in the art that the fin materials can be clad on both sides with aluminum-silicon brazing materials (e.g. see Description of Background Art - page 2, lines 3-12). In view of applicant's disclosure of the prior art it would have been obvious to one of ordinary skill in the art at the time the invention was made to clad the fin materials of Kawahara with standard aluminum-silicon brazes because this is disclosed to be conventional in the art in order to facilitate joining of fins to the heat exchangers. Kawahara may further differ from the claims in that although Kawahara may disclose thicknesses in Tables 2-5, Kawahara may not require that the fin material have a thickness of 80 μm or less. Applicant, however, clearly discloses that there is a motivation in the prior art to reduce the weight of automotive heat exchangers and therefore the thickness of the

materials (e.g. see Background of the Invention, page 3, line 3 - page 4, line 10). In view of applicant's disclosure of the prior art, it would have been obvious to one of ordinary skill in the art at the time the invention was made to reduce the thickness of the material of Kawahara to 80 μm or less because there is a clear disclosed prior art motivation to reduce the thickness of the materials in order to reduce the weight of the products.

11. Claims 1-2 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shinpo (Japanese publication 11-131166) in view of applicant's disclosure of the prior art.

12. Shinpo discloses that fin material for brazed automobile heat exchangers should be less than 0.1 mm (e.g. see Table 2 for specific thicknesses) and should further comprise a fibrous structure and recrystallized structure of 200 μm or less (e.g. see paragraph [0008] and see Table 2 for specific grain sizes) and the fin material can contain 0.5-2.0 mass % Fe, 0.05-0.3 mass % Zr, 0.5-3.0 mass% Zn (e.g. see paragraph [0009] and see Table 1 for specific compositions). Shinpo may not disclose details of cladding aluminum-silicon braze materials on both sides of the fin material, but applicant discloses that it is conventional in the art that the fin materials can be clad on both sides with aluminum-silicon brazing materials (e.g. see Description of Background Art - page 2, lines 3-12). In view of applicant's disclosure of the prior art it would have been obvious to one of ordinary skill in the art at the time the invention was made to clad the fin materials of Shinpo with standard aluminum-silicon brazes because this is disclosed to be conventional in the art in order to facilitate joining of fins to the heat exchangers.

Allowable Subject Matter

13. Claims 3-8 and 10-11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claim 9 would be allowable if rewritten to overcome the rejection under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims. The prior art of record does not disclose or make obvious the ranges of Si concentration in an Si dissolution area in a brazed section as required by claims 3 and 4. There is no motivation in the prior art of record to optimize this feature with regards to fin materials required in the claims. In addition, the compositions of claims 5-11 are not disclosed or made obvious by the prior art of record with regards to fin materials having the thicknesses and metallurgical structures required by the claims. Although the use of a fiber structure for heat exchanger materials and the discussion of grain structure relative to performance of heat exchanger materials after brazing is found in the prior art, the relevant prior art fails to disclose the compositions of claims 5-11 with these features. The prior art of record does not suggest any expectation or motivation to use the specific compositions of these claims with the specifically claimed metallurgical structures.

Conclusion

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The additionally cited references serve to further establish the level of ordinary skill in the art at the time the invention was made.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to John J. Zimmerman whose telephone number is (571) 272-1547. The examiner can normally be reached on 8:30am-5:00pm, M-F. Supervisor Deborah Jones can be reached on (571) 272-1535. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

16. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

John J. Zimmerman
Primary Examiner
Art Unit 1775

jjz
May 27, 2005